MS2012 – INTRODUCTION TO MANUFACTURING

Course Code	MS2012					
Course Title	Introduction to Manufacturing					
Pre-requisites	NIL					
Pre-requisite for	NIL					
No of AUs	3					
Contact Hours	LECTURES	26	Tutorials	13		

Course Aims

This course aims to introduce you to various processes for the making and shaping bulk materials, polymer materials, and semiconductor materials processing.

The objective of this course is to familiarize with the conventional manufacturing processes such as metal working, joining & cutting, casting, etc. and also the common processing steps in the polymer and microelectronics industry.

Intended Learning Outcomes (ILO)

By the end of the course, you should be able to:

1. Explain the basic concepts, mechanisms, design and applications of Metal Forming, and its role in Manufacturing Processes.
2. Apply basic concepts of alloy solidification to commercial casting processes and predict microstructures and element segregation.
3. Design components for manufacture by casting; avoid shrinkage.
4. Choose a suitable casting process for a given component depending on the shape, material, application requirements and production volume.
5. Identify the role of machining in manufacturing and the importance of cutting tool materials.
6. Describe non-conventional machining processes.
7. Explain basics of concepts of thermoplastic and thermoset polymers.
8. Compare basics concepts, mechanisms, and applications of polymer processing techniques.
9. Describe basics principles of vacuum techniques and thin film deposition techniques, and their roles in manufacturing processes.
10. Apply basics concepts and steps of electronic materials manufacturing processes.

Course Content

Fundamentals of casting and overview of casting processes. Fundamentals of metal deformation and overview of metal deformation processes. Machining and cutting of materials. Overview of polymer processing and electronics materials processing. Vacuum deposition processes. Basics of electronic material processing.

Reading and References

1. Kalpakjian S and Schmid SR, Manufacturing Engineering & Technology, Prentice Hall, 7th Ed, 2014.
2. Groover MP, Principles of Modern Manufacturing, Wiley International, 2nd Ed., 2002.

Course Policies and Student Responsibilities

You are required to abide by both the University Code of Conduct and the Student Code of Conduct. The Codes provide information on the responsibilities of all NTU students, as well as examples of misconduct and details about how students can report suspected misconduct. The university also has the Student Mental Health Policy. The Policy states the University's commitment to providing a supportive environment for the holistic development of students, including the improvement of mental health and wellbeing. These policies and codes concerning students can be found in the following link.
https://www.ntu.edu.sg/life-at-ntu/student-life/student-conduct

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Absentees must be supported by a medical certificate or other valid official documents.

Academic Integrity

Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values.

As a student, it is important that you recognise your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion and cheating. If you are uncertain of the definitions of any of these terms, you should go to the academic integrity website for more information. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.